ARCHITECTVRE

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UNIVERSITY OF PENNSYLVANIA
SCHOOL OF ARCHITECTURE

FOUR-YEAR COURSE. *(Degree B. S. in Arch.)* Architectural engineering may be taken in lieu of advanced design, etc. GRADUATE YEAR. *(Degree M. S. in Arch.)* Allowing specialization in design or in architectural engineering, etc. SPECIAL COURSE OF TWO YEARS. *(Certificate.)* For qualified draftsmen; affording option in architectural engineering. ADVANCED STANDING granted to college graduates and others for required work completed elsewhere. SUMMER SCHOOL in architecture, offering complete group of technical subjects, affords advanced standing in Regular and Special courses. Special circular. FULL INFORMATION on application to the Dean of the College Department, Dr. George E. Fisher, University of Pennsylvania, Philadelphia, Pa.

ARCHITECTURAL CRITICISM.

THE most impressive demonstration of the awakened public interest in beauty for its own sake has been in the case of the new terminals and stations erected by the great American railroads. Where formerly only utility was considered, impressiveness and architectural correctness have come to be as essential as convenience and the Lackawanna Railroad's magnificent Hoboken terminal, the new terminals for the Municipal Ferry, both at Staten Island and South Ferry, New York, and the new Union Stations at Washington, Pittsburg, New Orleans and elsewhere and the ferry houses at the foot of West 23rd Street, New York, alike display conspicuously a search not only for good, but of fitness to the purpose. The two stations, however, which, possibly excepting the one in Washington, have aroused most interest and curiosity among the architects, have been the terminals of the Pennsylvania and the New York Central Railroads in New York City. The enormous cost of the property on which these were located, the tremendous traffic to be handled through them, and the immense future expansion for which they have provided have united to focus public interest upon them, and the opening of this, the first of the two to be completed, has been eagerly awaited. The New York Central made its announcement of the building of a new terminal some years ago before the Pennsylvania's plan was made public, but the Pennsylvania's Station (Plates LXXXIX and XCVIII) in spite of the fact that its execution was attended with much greater difficulty than that of the New York Central, has been the first to be completed, and so little of the New York Central's scheme has yet been erected that comparison between the two is impossible. I am even informed that the decision of the New York Central as to what sort of a building to erect over the main portion of the site is not yet final. The difference in the methods pursued by these two railroads in obtaining their drawings has been very striking; the New York Central employing the services of architects to make them sketches for purposes of study over a period of years and finally opening a competition to a number of the foremost architects of New York, while the Pennsylvania station was directly given into the hands of McKim, Mead and White and worked out with them by the Pennsylvania Railroad's engineers. Certainly the latter scheme has proven a great time-saver; but whether this is due as much to the system employed in selecting the architect as to the consummate knowledge of its requirements for which the Pennsylvania Railroad is famous, is another question.

To come to the station as built, taking up first the plan, this seems to an outsider without much knowledge of the exact requirements of the railroad to be possibly not the best obtainable. The main access to this station will undoubtedly be from the 7th Avenue end, and while there is at present no subway connection on 7th Avenue, the nearest rapid transit facilities are the McAdoo tunnel system and the elevated railroad on 6th Avenue, and the fact remains that the principal approach is from 7th Avenue, and in order to enter the trains passengers are required to walk nearly a full block from 7th Avenue after entering the station. It is most improbable that there were not very good reasons for placing the concourse on the 8th Avenue end, and assuming this to be an essential the approaches seem to have been exceedingly well arranged.

A feature of especial interest in the approaches is the manner in which the carriage entrances have been carried to the lower level from 7th Avenue, permitting entrance to the general waiting room at this lower level direct, while the foot passenger entrances have been provided at the street level from 31st and 33rd Streets and 7th and 8th Avenues, dropping gradually by easy and impressive gradations into the waiting room. The main entrance towards 7th Avenue is through an arcade at the side of which are booths, while the ground floor in 7th Avenue has on either side of the entrance to the arcade, spaces for shops, one of which has already been taken by one of the large banks in anticipation of the growing demands of business in that locality. The track level is two stories below the street level, and one story below the concourse and general waiting room, and to my mind the most remarkable feature of the whole scheme is the wonderful way in which these tracks are illumined by natural light. The brilliancy of their illumination must be seen to be appreciated and from the plans and photographs presented herewith is literally inconceivable. The waiting room and concourse are both of enormous size, the scale of the plans herewith being so small that no adequate conception of the width of the staircases and approaches and of the rooms themselves can be formed. Like the track level the astounding thing is the natural lighting of all these rooms. We have grown so accustomed to dark and gloomy interiors in our terminal facilities here in New York that the impression of airiness and light given in all parts of this station is amazing; and one cannot sufficiently admire the courage of a railroad which spent one hundred and fifty million dollars for approaches and terminal station, the interest on which must be paid almost entirely through increased traffic, and not by leasing portions of the building to outside interests; this makes a low building possible with its attendant spacious airiness.

Looking at the building from the standpoint of design alone the problem is also somewhat confusing. A French architect who visited this country a year or two ago, published in the *New York Times* an interview regarding New York buildings, in which he stated that the Pennsylvania Railroad station had employed in its design motives entirely unsuitable to its purpose, quoting especially the temple forms used as porches and the well-known bath motive used to enclose the waiting room. But it may be well considered if the fact that a certain motive was originally used to house a certain type of business it is thereby rendered unfit for all other purposes; if this is the case the Pennsylvania Railroad station is certainly entirely unsuitable in design for its purpose, but for my own part I cannot think why a motive intending to give light to a great interior space is not equally well fitted to a waiting room of an American railroad station or a Roman bath, when the conditions were alike, and agreeing with the French critic that the exterior was largely designed along the lines of Roman motives, I maintain that columns in groups of four or six are so arranged to make conspicuous an entrance, and that their use on the Pennsylvania station is quite as rational as it was in a Roman temple. The Romans themselves did not think it necessary to confine this motive to the temple form, but appreciated its utility and beauty, the palaces, temples and baths, which in Roman days were the places of greatest resort, were treated in this, which was in Roman times, and has remained to-day, the most dignified and satisfactory way of marking an entrance. We will agree that the design does not at once suggest a railroad station, because the only motive to which we have become accustomed to regard as a railroad station, is a great steel and glass train shed; here no train shed was required, only a beautiful covering for entrance to a subway, and just why a new architecture should be devised to fit these requirements is not clear. Certainly the curtain walls of columns along the sides of the building supporting a covering over the carriage entrance, which forms a sort of monumental porte cochère, in other words, could be no more practical if it were composed of structural steel members, and the great waiting room itself, built of marble and artificial stone, although of Classic design, adequately fulfills its purpose in giving a light, beautiful and spacious hall of impressive aspect and with the advantage that no maintenance charges will be necessary.

The line of argument heretofore pursued fails, however, when we reach the concourse, which is entirely composed of steel, glass and concrete, and the underlying thought in the selection of materials for this space as explained to me by one of the officials, was to form a sort of transitional link between the masonry exterior and the pure commercialism of the tracks. Perhaps it might have been impossible to obtain this effect with any more monumental treatment, and there is indeed something of grandeur in the thought that the great concourse and the track work are the last word in the manufacture by men's hands from earth and ore of steel, glass and a material as durable as stone. Yet the last word of to-day will very soon be the by-word of to-morrow, and for myself I believe that the pure beauty of the most part of the station will always remain good, while the concourse, impressive as it is at the moment, will in the light of future developments of its materials become antiquated and lose its æsthetic value. The individual rooms and approaches are without exception beautifully treated, though each architect will have his idea of where certain details might have been improved. In the main waiting room, for example, the single columns supporting the vaulting seem to me somewhat inadequate for their purpose, and the entablature which they support might well have been carried around the room instead of appearing, as it does, sporadically. The coffering of the vaulted ceiling is, however, very beautiful, and the quiet and restful colors employed throughout this interior, with mural decorations in the panels of simply colored maps, are both appropriate and unique. They are not in the ordinary sense advertisements of the Pennsylvania Railroad, but form rather, appropriate spots of subdued color in the scheme of the interior wall, calling to mind the enormous transportation facilities of to-day. The restaurants are both treated in a simple and very dignified style, while the driveways in 31st and 33rd Streets and the arcade from 7th Avenue opposite 32nd Street are masterpieces, almost without precedent.

Two features of the scheme from the æsthetic side seem most remarkable; one the individuality of the texture which McKim, Mead and White have been able to instill into the time work motives executed in the most difficult of materials; and second the light and harmonious color scheme adopted throughout. The exterior is of pink Milford granite and the interior in what may be called a warm gray or buff artificial stone, resembling in its finish the tufa of Roman work. The whole building then presents a scheme in which all the masonry work, including the plastering, is of soft brown tones, relieved in the large waiting room with the dull blue and sienna of the maps, while the iron work is emphasized by its green-toned paint.

The most astonishing characteristic of McKim, Mead and White's work has always been that they were able to instill so much of personality into motives lifted almost bodily from the antique. It is hardly necessary to recall to one's mind those others of their great works, the Madison Square Garden, The Boston Public Library, The Columbia Library, The

Gorham Building, in each of which apparently no attempt has been made to invent, but no hesitation has been shown in adapting old motives to new uses, and I think in every case their buildings have shown that best of qualities—really original design—in that each of them has distinct personal quality and that indefinable something which for lack of a better term we call "feeling"; and it is upon their ability to instill this quality into all their design that rests their tremendous and deserved pre-eminence among the architects, not only of the United States but of the world at large.

CONDUCT OF COMPETITIONS A. I. A.

To the Editor of ARCHITECTURE:

DEAR SIR:—Recent editorials in architectural journals strongly support the present effort of the American Institute of Architects to improve competitions, yet communications and minor notes show, in some cases, such a lack of information that it seems well that some statement on the subject should be made.

It is obvious that any improvement in the conduct of competitions can take place only as a result of the general enlightenment of the profession and through it of the public. After many years of discussion, the profession appears to have reached substantial agreement as to what are the essentials of a well-conducted competition. Without such agreement, the present advanced position of the Institute would be out of the question.

The Institute has made many attempts to inform the public as to the proper conduct of competitions and to dissuade architects from taking part in them except under proper conditions. Its carefully prepared statements, though they had an excellent educational effect, were without other result since they were merely advisory.

The Institute never has presumed, nor does it now presume, to dictate the owner's course in conducting a competition, but it aims to assist him by advising the adoption of such methods as experience has proved just and wise. But the Institute has at last reached the conclusion that the most effective means within its command for the improvement of competition practice lies in seeing to it that its own members do not take part in ill-regulated competitions.

Architects generally have for many years regarded the Institute as the highest authority on the ethics of the profession and the Institute is certainly within its province when it instructs its members as to what is good competition practice and requires them to conform to it just as when it instructs them on other questions of professional ethics and requires them to conform to these instructions.

In consonance with these thoughts, the convention of 1907 adopted certain principles as in its opinion fundamental to the proper conduct of competitions while that of 1908 decided that any competition not conducted in accordance with them should be formally disapproved by the Institute.

In practice it was found that it was impossible to gain a knowledge of all or even of any large proportion of the competitions throughout the country so as to disapprove those not in harmony with the Instiue's principles. It was also difficult and expensive to notify all members each time that a competition was disapproved. Thus many badly conducted competitions escaped attention and were open to the participation of members.

It became obvious that the converse of this scheme provided a more practicable course. The convention of 1909, therefore, adopted the principle that participation in any competition the program of which has not been approved by the Institute is unprofessional conduct.

The convention gave the Board authority to approve acceptable programs and power to delegate that authority. Thus it became necessary for the Board to establish a standard by which to test programs submitted for approval. Fortunately the opinion of the profession as to the essentials of a good program being well crystalized, the Board found its task easier than it had anticipated.

The formulation of these essentials resulted in a "Circular of Advice Relative to the conduct of Architectural Competitions" which serves the purpose of informing the public on the whole subject; of instructing architects as to what the Institute regards as good practice; of strengthening the position of advisers chosen to conduct competitions as well as of setting up a standard to which programs must conform if they are to receive the approval of the Institute.

The Board delegated its power of approval to the Standing Committee on Competitions and to a sub-committee for the territory of each Chapter. Each of these sub-committees deals only with competitions for work to be executed within its own territory. Programs for work not within the territory of any Chapter are passed upon by the Standing Committee.

The Circular of Advice is, in general, an essay on competitions, and it is in the main—as its name indicates—merely an advisory document. The Board found comparatively few things so essential to the proper conduct of a competition as to be made mandatory. Its instructions to the Committees charged with giving the Institute's approval are that the program should conform to the spirit of the Circular of Advice, but as this statement might be interpreted in various ways, more specific directions are given.

1st. Approval must be withheld if a program appear not to be in consonance with law.

2nd. Except the law requires an open competition, approval may not be given to one in which no precautions are taken that the competitors are competent to design and execute the work.

3. As experience shows that unless a professional advisor be in charge of them, competitions are almost always hopelessly bad, the Institute will give its approval to no competition that is not in charge of such an advisor.

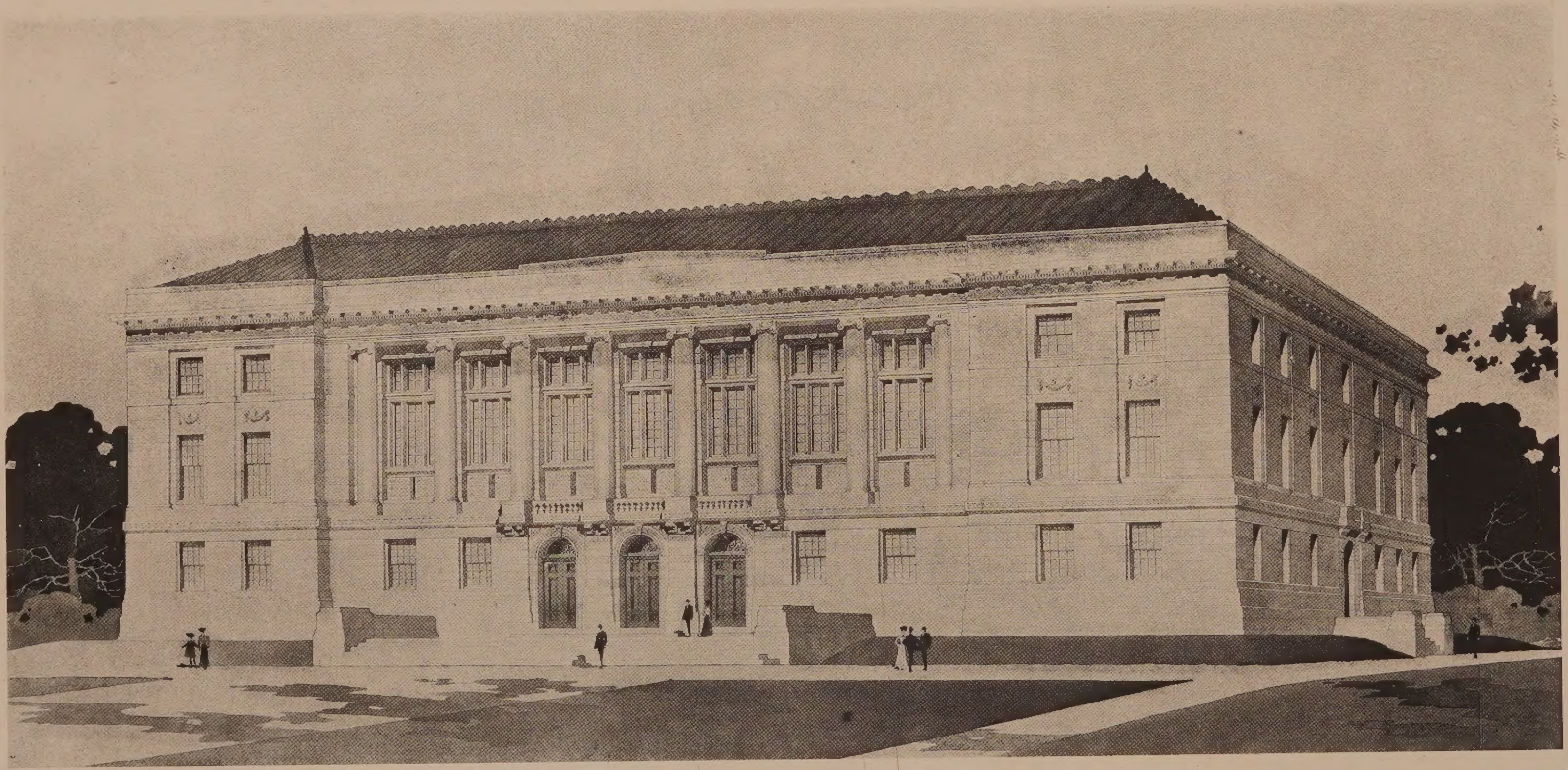
4th. The Institute will approve no program that does not constitute a contract between the owner and the competitors guaranteeing that an award of the commission to design and supervise the work will be made to one of the competitors, nor will it sanction a program which fails to establish the terms of the winner's employment as those of the Institute's Schedule. There must also be provision for adequate compensation in case of the architect's dismissal or of the abandonment of the work.

It would seem that no argument is necessary to show that lacking any of the above requirements, the program fails to reach such a standard as the Institute should set for its members.

A brief summary of the advisory portions of the circular would show that they treat the subject as follows:

1st. It is pointed out that competitions are not generally to the advantage of the owner, that it is better to employ an architect on the basis of his fitness for the work and that if a competition must be held, the interests of the owner will be best served by equitable and definite agreements between himself and the competitors.

(*Continued page 153*)



ACCEPTED COMPETITIVE DESIGN, OHIO STATE UNIVERSITY LIBRARY, COLUMBUS. (Plans pages 154-155).

Allen & Collens, Architects.

(*Continued from page 151*)

2nd. The role of a Professional Adviser is defined and his employment urged.

3rd. The owner is advised not to hold a competition open to all comers, but to carefully select his competitors.

4th. The kinds of competition recognized by the Institute are defined.

5th. Strict anonymity of competitors is urged.

6th. The owner is advised to avoid various pitfalls in respect to the cost of the proposed work, competitors' and builders' estimates, etc.

7th. The owner is urged to receive the advice of a competent jury before making the award.

8th. Reasons are given why drawings should be as few in number and simple in character as will express the general design of the building.

9th. A program is outlined in detail, some twenty statements being made as to its essential contents.

10th. The question of what constitute proper agreements between owner and competitors and between owner and winner is treated at length.

11th. The proper conduct of architects and of the owner is considered.

The Circular was issued on the 30th of March, 1910, and was widely circulated among members of the profession and the public generally through owners, editors, educators, etc. Copies of it may be obtained from Mr. Glenn Brown, Secretary of the American Institute of Architects, the Octagon, Washington, D. C. Its reception was marked by general approval and it has since been in successful operation. Many programs have been brought into harmony with its requirements and have received the approval of the Institute. In some instances, the owner on receiving the Circular has decided to abandon the idea of a competition, and has chosen his architect directly, a much-to-be-desired result. In the instances in which the program was not brought into harmony with the principles approved by the Institute, the results have justified members in not taking part in the competition, since the outcome in most cases shows either failure to appoint any competitor as architect or failure to proceed with the work for which the competition was held.

Very truly yours,
Frank Miles Day,
Chairman.

COMPETITION CONDUCTED BY THE BUILDING TRADES EMPLOYERS' ASSOCIATION OF NEW YORK.

DESIGNS to be for single or detached buildings, providing accommodations:

1st—4 rooms—1 or 1½ stories high, cost not to exceed $2,500.

2nd—8 rooms—2 or 2½ stories high, cost not to exceed $4,500.

The number of rooms stated does not include bathrooms, although provisions in each design must be made for the same.

A cellar is to be provided for in each design, either under part or whole of the house.

Walls of the buildings may be of concrete blocks, or terra cotta blocks, in either case to be finished with cement stucco or hollow concrete blocks of plain, paneled or bush hammered face—or they may be of monolithic construction—or lath finished with cement stucco.

Wooden floor joists and roof timbers may be used; roof coverings may be of cement, tiles, slate, shingles or ready roofing. Chimneys either brick, concrete or stone; cornices, porch rails and other details of wood or concrete, but whatever material is used—simplicity of design is suggested.

Plumbing, water supply and heating system and electric wiring to be provided for, but the costs stated above are not to include the same.

Each design must show plans of all stories above the cellar, three elevations and a section, all at the scale of ¼ inch per foot. The competitor may substitute a perspective and one elevation for the three elevations if he so desires.

Each design must be accompanied by a brief typewritten specification, also a statement containing cubical contents and itemized cost of materials and labor.

This competition is to be conducted anonymously; therefore, no cipher, nom de plume, identifying mark or name shall appear on any drawing or wrapper, but each drawing shall be accompanied by a card, bearing the name and address of its author sealed in a plain envelope and addressed to the Committee on Competition, Building Trades Employers' Association, 34 West 33rd Street, New York City.

Any competitor who shall in any way violate the anonymity of the competition will be excluded from all participation in the awards.

Each design and its accompanying envelope containing the name of the author will, when received, be given a number by the chairman and the design will be known by this number until after the awards have been determined.

It is the intention of this Association to erect a half size model at some future time of the designs in each class awarded first prize—the same to be on exhibition to the general public in their free exhibition for a period of at least six months.

There being two classes, prizes will be awarded as follows: First prize, first class, $100; second class, $150; second prize, first class, $50; second class, $75; third prize, first class, $30; second class, $50.

For each additional design awarded honorable mention, not to exceed three in number in each class—$20 to be paid.

Any competitor may submit as many designs in one or more classes as he may choose, but all such designs must be enclosed together and must contain a plain envelope and card as provided for above.

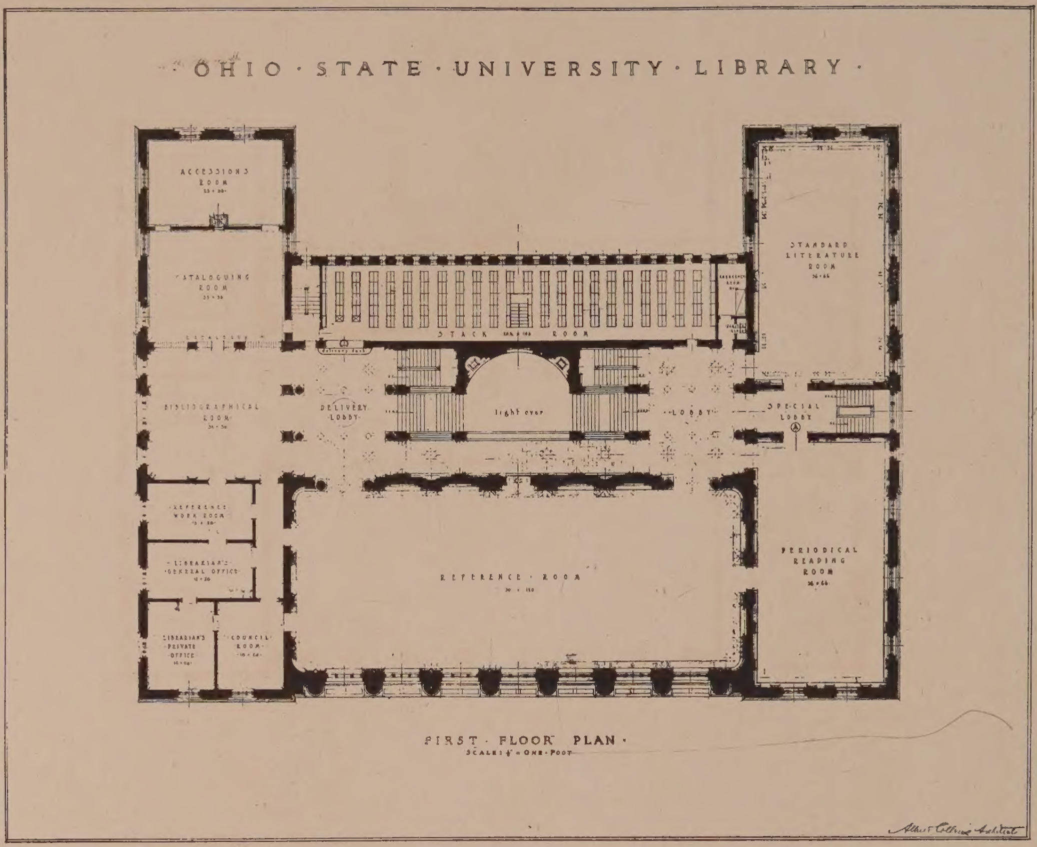
The same competitor will not be eligible to receive more than one prize, either 1st, 2nd or 3rd in any one class, but he may receive as many honorable mentions as the judgment of the committee may award.

All designs receiving prizes or honorable mention shall become the property of the Building Trades Employers' Association, who shall have the privilege of publishing and distributing them with the designer's name attached. Any designer receiving an award will be allowed to photograph or trace his design.

Designs receiving no award will be returned to their authors by the Association free of expense to the authors.

All designs to be submitted on or before December 1, 1910.

The committee to judge the designs submitted will be William A. Boring, Donn Barber, Grosvenor Atterbury.



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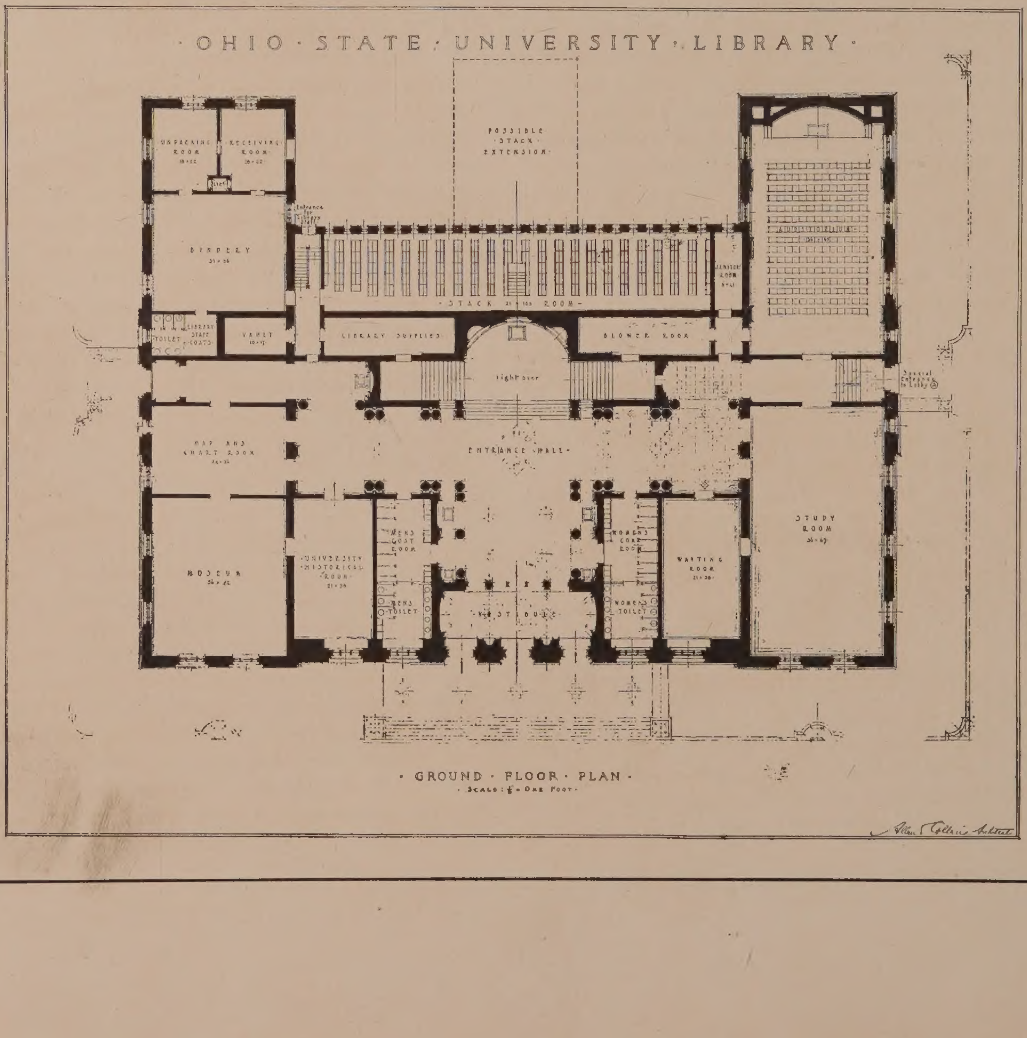
SCALE ¼" = ONE · FOOT



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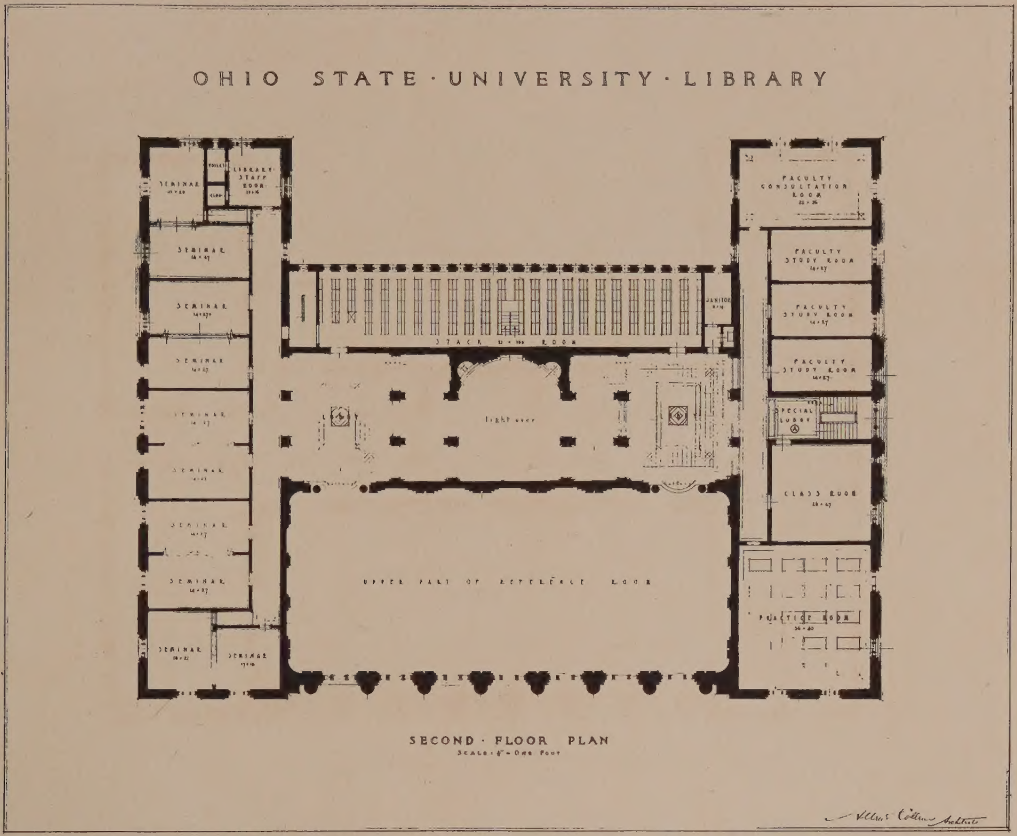


WE are publishing the drawings by Allen and Collens, which were successful in competition for the Library of the Ohio State University. The preliminary program of this competition was disapproved of by the Committee of the American Institute of Architects. The competing architects, however, at a conference with the trustees of the University, obtained their approval of a program following in all respects the requirements of the present Code of Ethics, as relating to competitions. This is one of several cases in which the adoption of the present code has worked to the advantage of more uniform and satisfactory conditions as regards competitions in general.

THE scholarships of the Architectural League of America in Harvard University have been awarded to the following:

Robert Finn and Henry Janson of Detroit, and Frederick Larsen of Boston, with Ernest Hayward of Somerville, Mass., as alternate. The award was made by the teaching staff of the Department of Architecture of Harvard University and Mr. Edmund Wheelwright of Boston, representing the League. Thirteen men submitted final drawings, the competition being as a whole very satisfactory.

PENNSYLVANIA TERMINAL, NEW YORK.

THE New York station of the Pennsylvania Railroad, now completed, covers more territory than any other building ever constructed at one time in the history of the world. The Pennsylvania station is unique, covering as it does eight acres of ground, with exterior walls extending approximately one-half of a mile, all told, and having been erected in less than six years' time.

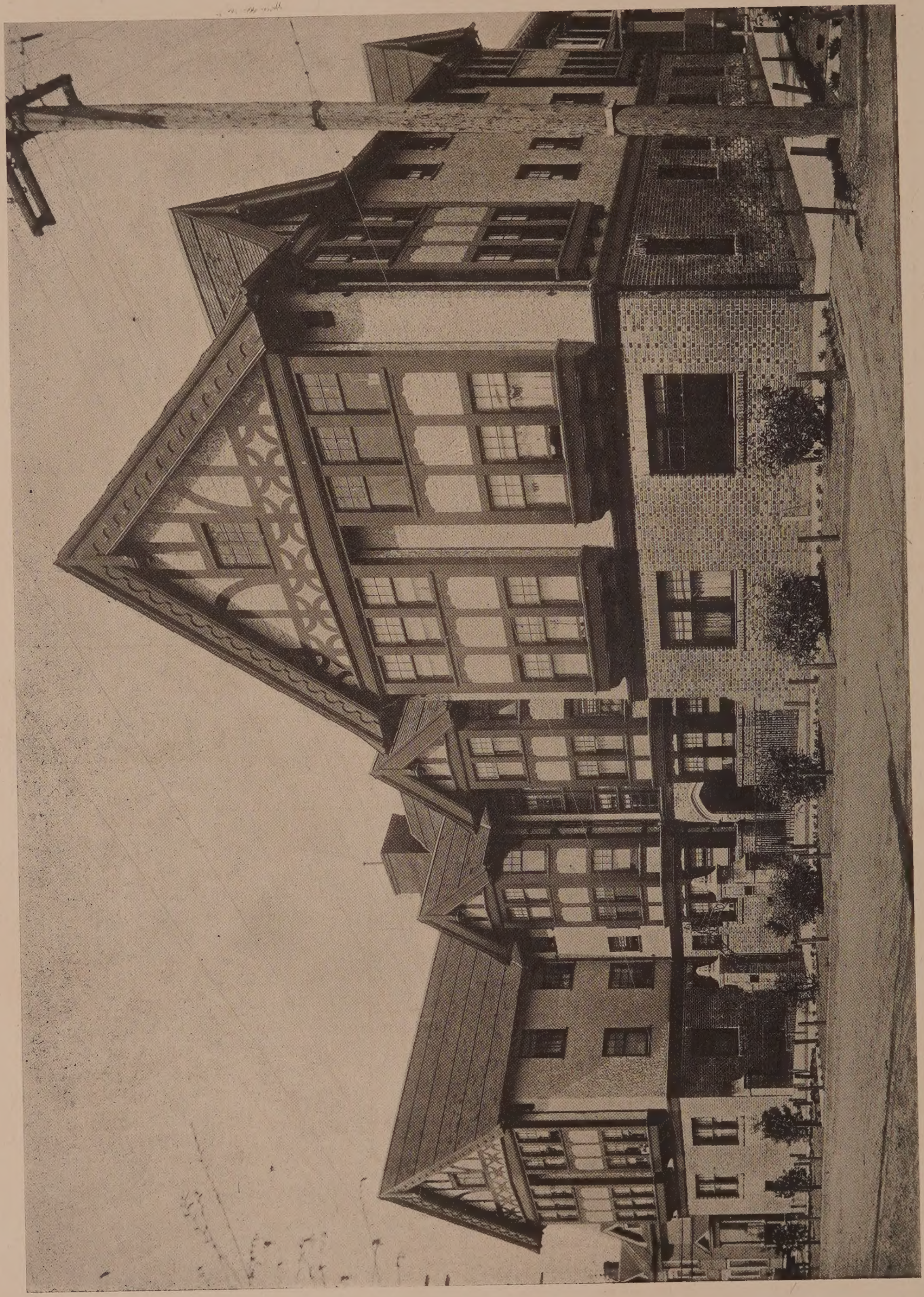
Built after the Roman Doric style of architecture, it covers the entire area bounded by Seventh and Eighth Avenues and Thirty-first and Thirty-third Streets. The depth of the property on both streets is 799 feet 11¼ inches, and the length of the building is 788 feet 9 inches, thus allowing for extra-wide sidewalks on both side streets and avenues. The walls extend 430 feet 6 inches from Thirty-first Street to Thirty-third Street, the Seventh Avenue façade signalizing the main entrance.

While the façades of the station were designed to suggest the imposing character of the ancient Roman temples and baths, the impression intended to be made upon the layman approaching the station, in full view of the exterior of the general waiting room with its huge semi-circular windows, is that of one of the leading railway stations of the world.

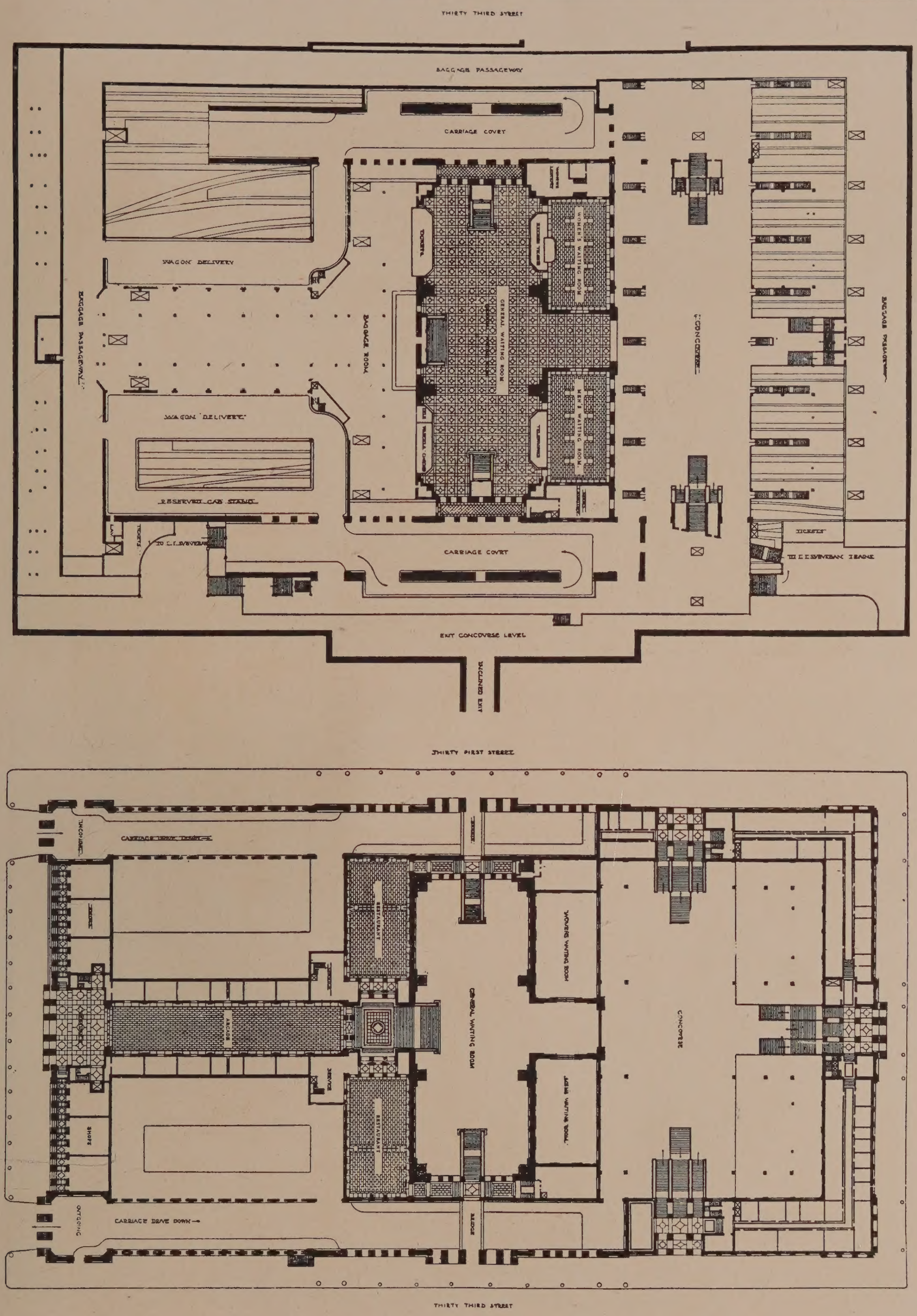
In designing the exterior of the building, Messrs. McKim, Mead & White, the architects, were at pains to embody two ideas: To express in so far as was practicable, with the unusual condition of tracks below the street surface and in spite of the absence of the conventional train shed, not only the exterior design of a great railway station in the generally accepted form, but also to give to the building the character of a monumental gateway and entrance to a great metropolis.

The main body of the building approximates in height the Bourse of Paris, reaching 76 feet above the street level. With entrances through the two corners of the station on Seventh Avenue there are carriage drives, each

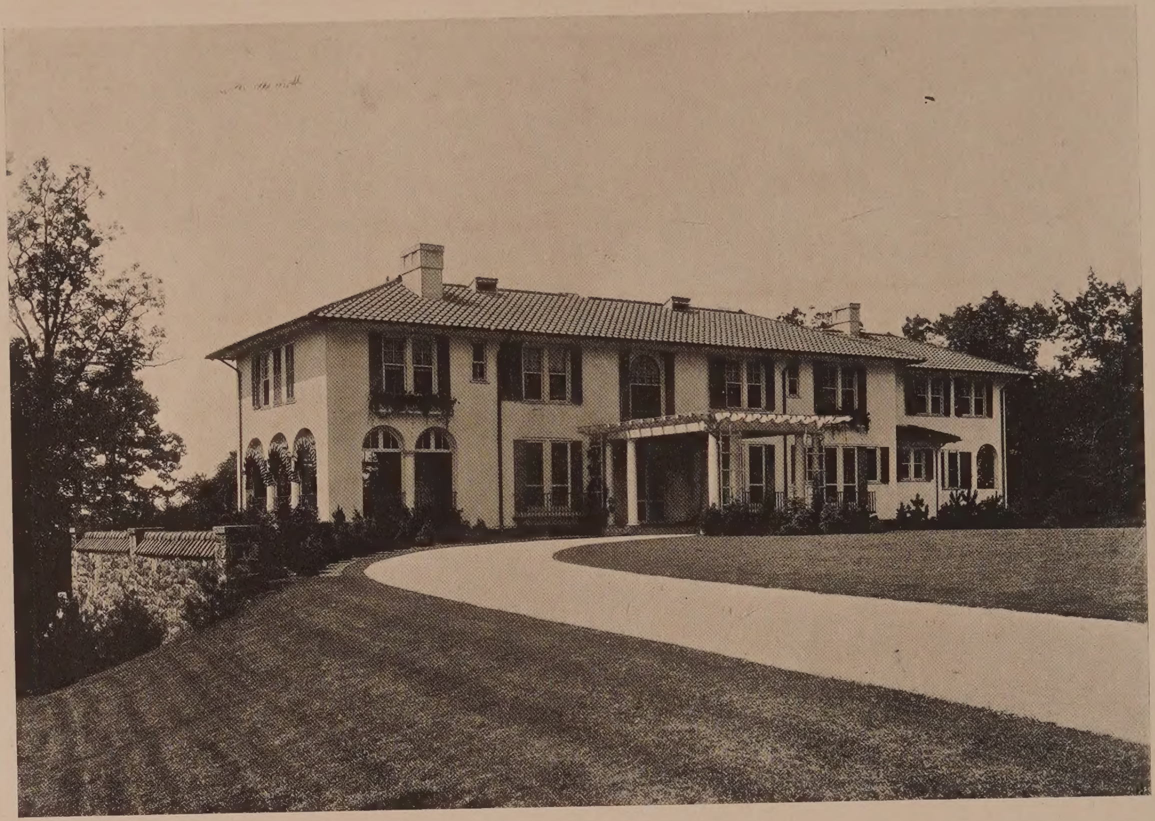
(Continued page 163)

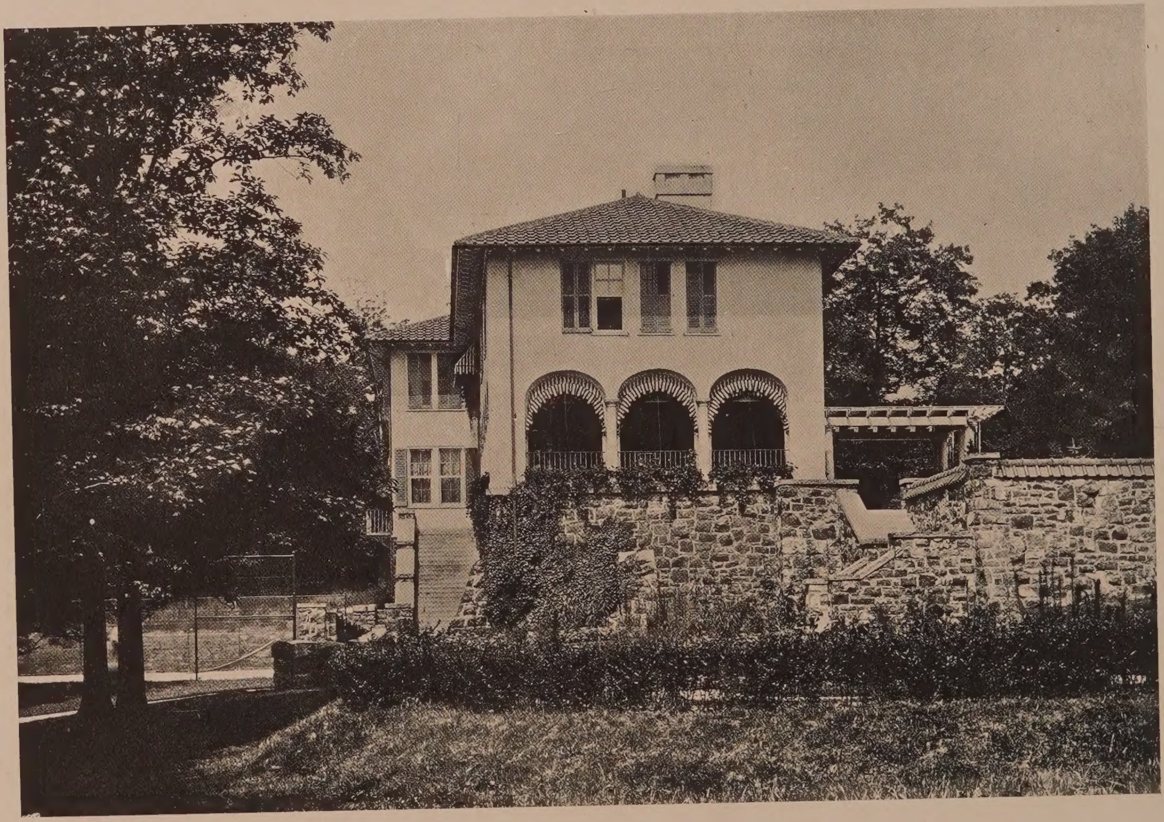


HOLLYWOOD APARTMENTS, SEATTLE, WASH. Kinnear Pressed Radiators. Architect.



PLANS, PENNSYLVANIA STATION, NEW YORK. McKim, Mead & White, Architects.





COUNTRY HOUSE, B. F. REINMUND, ENGLEWOOD, N. J.

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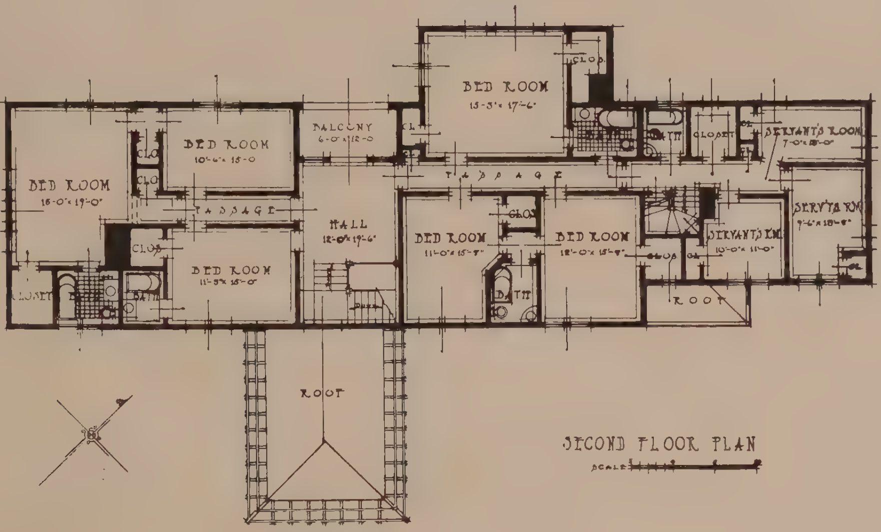

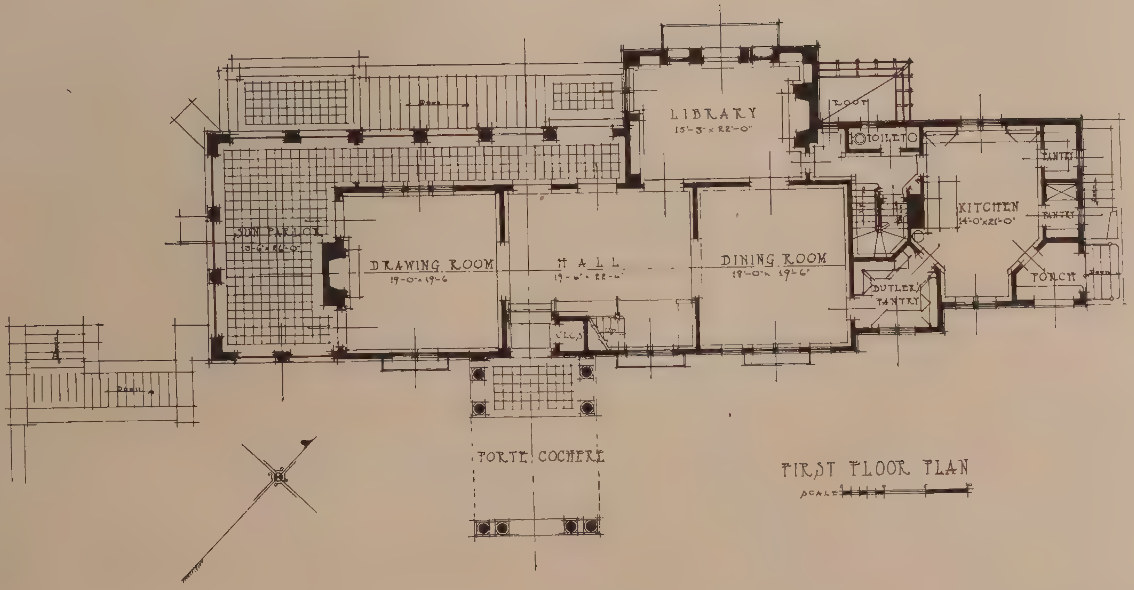

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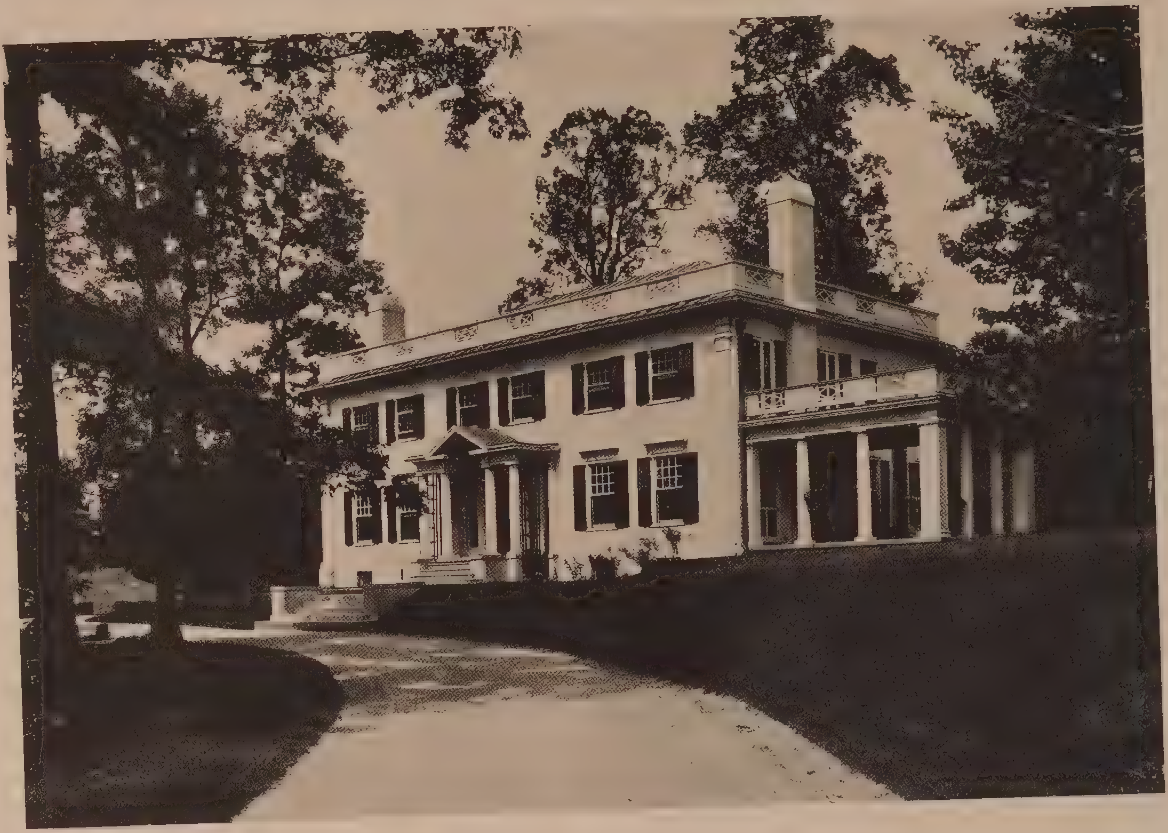
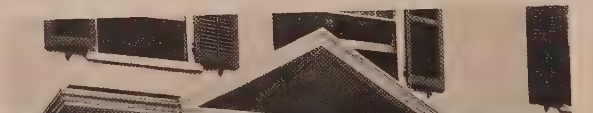
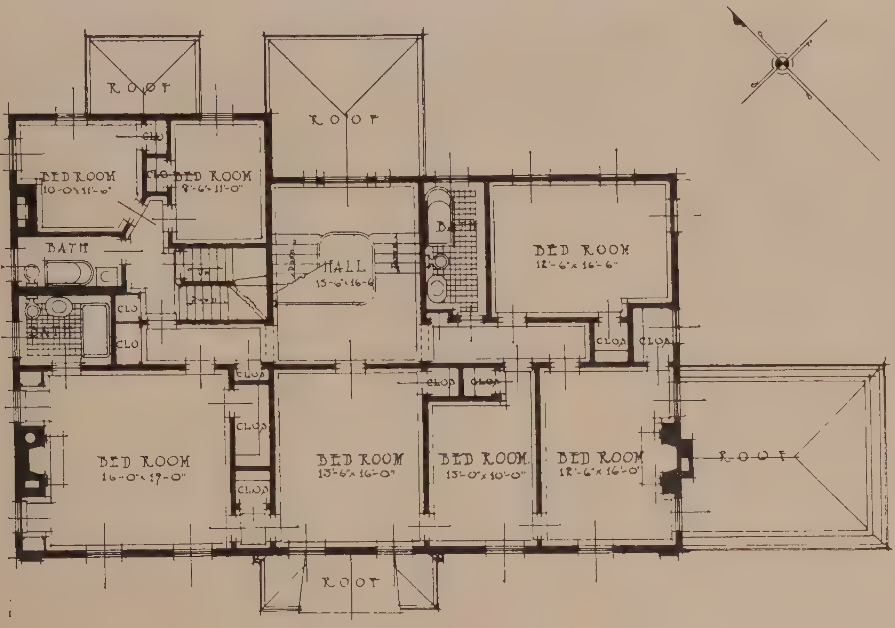
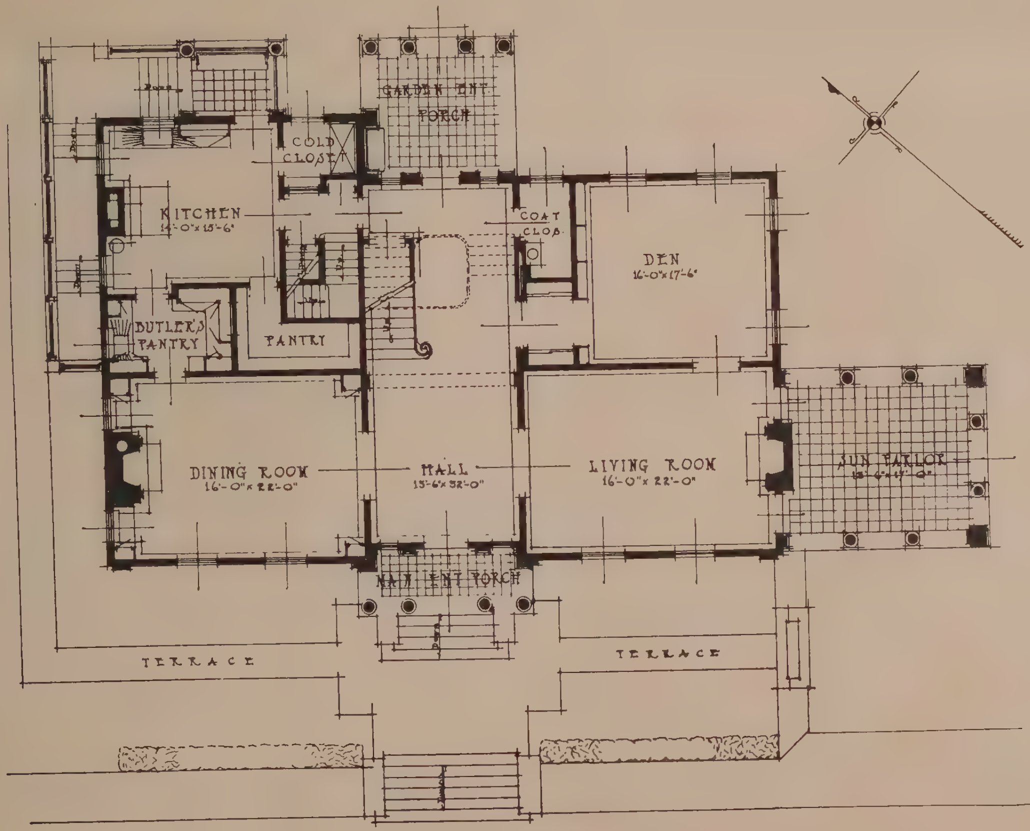




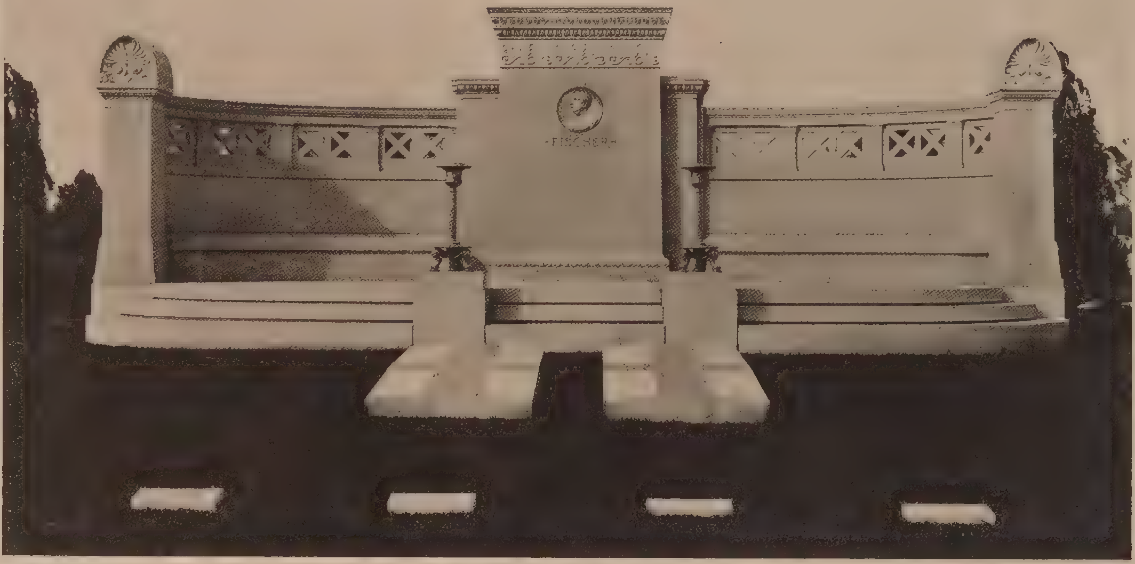
Country House,
Henry W. Blake, Englewood, N. J.
Davis, McGrath & Kiessling,
Architects.



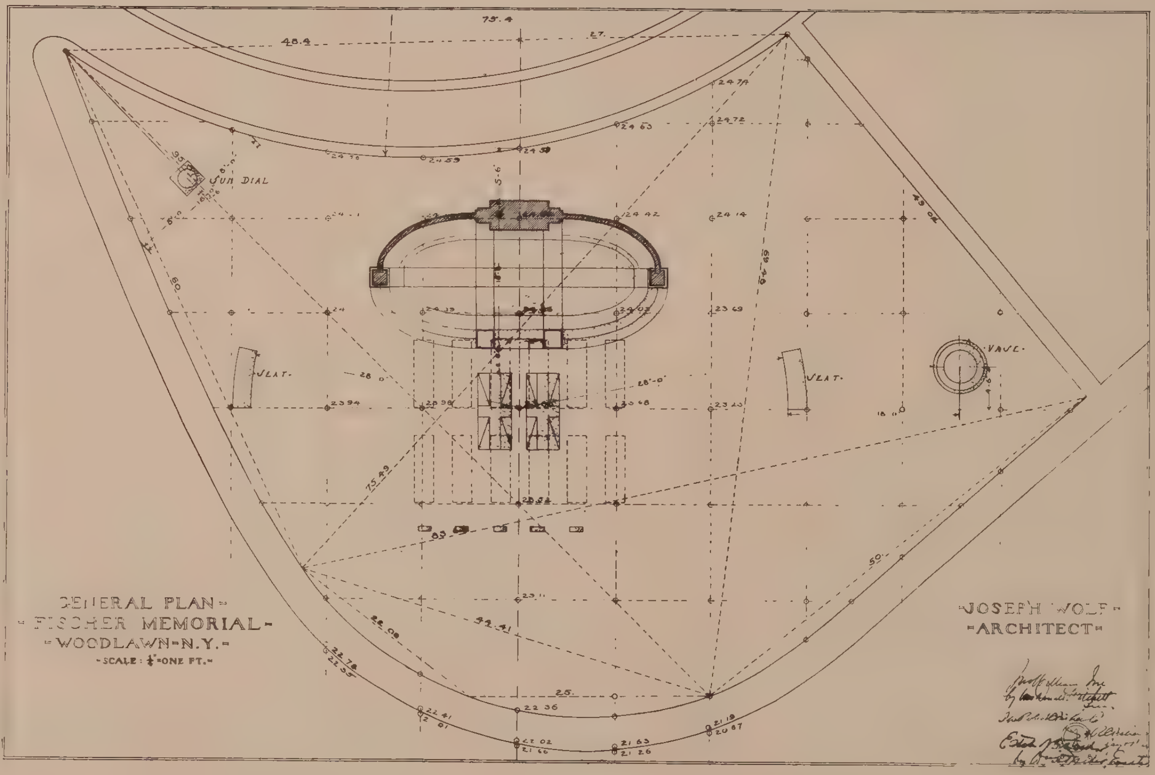
SECOND FLOOR PLAN
SCALE



PLANS, COUNTRY HOUSE, HENRY W. BLAKE, ENGLEWOOD, N. J. Davis, McGrath & Kiessling, Architects.



FISCHER



GENERAL PLAN
FISCHER MEMORIAL
WOODLAWN N.Y.
SCALE: ⅛" = ONE FT.
JOSEPH WOLF
ARCHITECT
SUN DIAL
SEAT
SEAT
VAULT
75.4
48.4
50
25.
42.41
75.49
49.02

(*Continued from page 155*)

about 63 feet wide, or almost twice the width of a standard New York City street, fronted by double columns and pediments. The narrowest opening between the columns is practically equal in width to the arched driveways in the Louvre, through which the omnibuses of Paris pass. The frontage is the same on Thirty-first and Thirty-third Streets. The walls of the exterior of the carriage drives are of pilaster treatment for a distance of some 279 feet.

The central features of the façades of the Thirty-first and Thirty-third Street sides for a distance of about 230 feet are formed by a colonnade opening into the carriage driveways below. Over the central porticos of these colonnades are ornamental clocks and eagles, similar to those in the Seventh Avenue front. From the openings in the center, bridges for the use of foot passengers entering from the street level lead directly over the carriage driveways to the general waiting room. West of these carriage courts, and along the Eighth Avenue front, the general scheme of design is continued by the use of pilasters in place of columns, except at the three entrances to the concourse and offices. This entire section of the building is composed of four stories of offices given over to the use of the local executive staff of the railroad company.

The Eighth Avenue frontage is treated on the plan of pilasters except for 44 feet 6 inches; this part is broken by columns into intervals of three spaces to mark another spacious entrance to the main floor of the concourse.

The total skylight area consists of approximately 80,000 square feet. Over the train shed, in the courts at the Seventh Avenue side, there are two hipped monitor-top skylights, both precisely alike, having a total area of 26,000 square feet. Around the central portion of the building there are thirteen hipped skylights of varying size. Over the concourse there are three large hipped skylights, sixty-three sawtooth skylights glazed on each side with curved ridges, and vertical gable ends. And from the ends of the sawtooths there are skylights extending over the circular or barrel-shaped roof, having an area of about 13,000 square feet. Around the outer portion of the concourse roof, supported by Guastavino construction, there are twenty-three monitor skylights, fourteen circular and nine elliptical. The care involved in much of this work will be appreciated when it is remembered that no curved glass was used, despite the fact that in the sawtooth and Guastavino lights (and especially because some of the latter have elliptical outlines), comprising a total of over 30,000 square feet, each light of glass lies in a plane different from that of the adjoining lights, and all this glass is of irregular shape in surface dimensions.

One of the distinctive features of this building is the waiting room, which extends from Thirty-first to Thirty-third Streets, its walls parallel to Seventh and Eighth Avenues, for a distance of 314 feet 4 inches. The height of this room is 150 feet and its width 108 feet 8 inches. The walls of the waiting room above the main body of the building contain on each side three semi-circular windows of a radius of 33 feet 4 inches, and 66 feet 8 inches wide at the base. There is also a window of like size at each end of the waiting room.

The dignified design of the interior of the waiting room, while fully adapted to modern ideas, was suggested by the great halls and basilicas of Rome, such as the baths of Caracalla, Titus and Diocletian, and the basilica of Constantine, which are perhaps the greatest examples in history of large roofed-in areas treated in a monumental manner.

The main waiting room on the concourse level is the largest in the world. Within its walls are located the ticket offices, baggage checking windows, and telephone and telegraph offices, so conveniently arranged that a passenger may proceed from one to the other with a minimum amount of exertion and without retracing his steps. Adjoining the general waiting room on the west side are waiting rooms, each 58 by 100 feet for men and women. These open into retiring rooms.

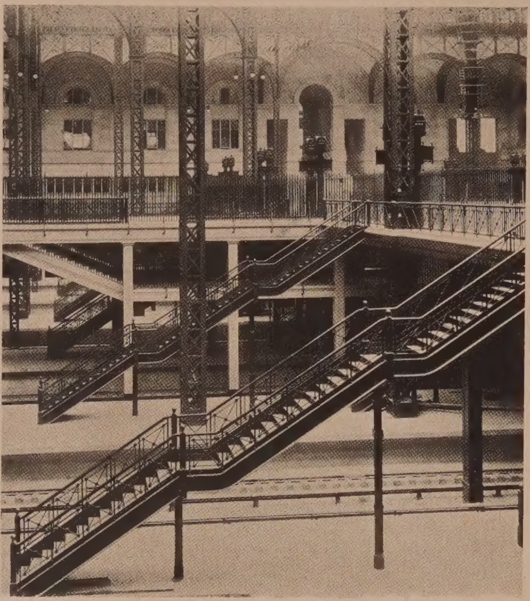
The grand stairway, 39 feet 6 inches wide, is constructed of Italian "Travertine" stone. It leads from the arcade into the general waiting room, and from it one gets a view of the main entrance to the arcade and of the entire waiting room.

The Roman Travertine used in the arcade and general waiting room of the station for the walls, and for all columns, pilasters and stairways, comes from the quarries in the Roman Campagna, near Tivoli, Italy. It is the stone of which imperial and modern Rome is principally built, these quarries having supplied the major part of the building stone of Rome for many centuries. Notable examples of its use are the Coliseum and St. Peter's Cathedral. It was imported into this country for the first time by the Pennsylvania Railroad Company for use in the Pennsylvania station in New York.

Travertine stone was used in the construction of the station for the reason that while it is very hard and durable, it has an openness of texture which makes it particularly suitable for use in areas of such unusual dimensions as the Pennsylvania station, giving a character and distinction to the surface which could not be obtained with a stone of more uniform appearance. Moreover, the stone tends to take a polish when rubbed up against rather than absorb dirt, which makes it very practical for public station uses. Its warm, sunny, yellow color is pleasing, and in this respect it is distinctly superior to almost any of the stones available in the North American continent, which are, as a rule, of a cold gray color. Through the use of this stone, the general waiting room has a mellowness of tone which is very noticeable, even on the cloudiest days.

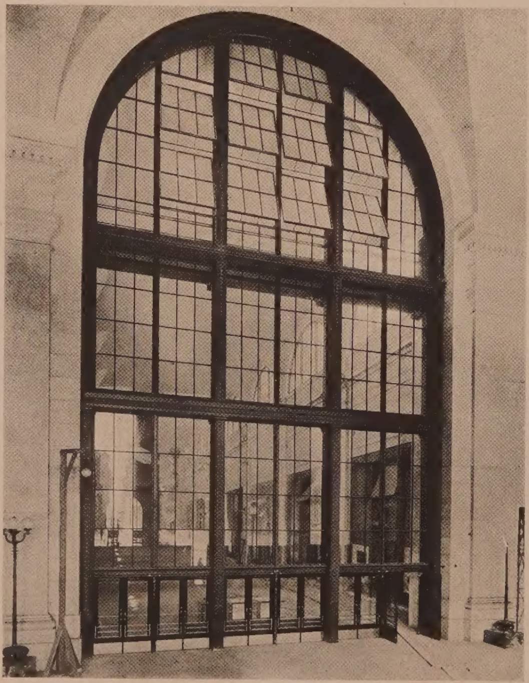
This station is not only the largest structure of its kind in the world, but it epitomizes and embodies the highest development of the art of transportation.

Among the prominent contractors and manufacturers represented in this building are the following: Cutler Mail Chute Company, mail chutes; National Ventilating Company, the new Multiple Unit system of skylights; George A. Fuller Company, general contractors; Hydrex Felt & Engineering Company, the foundation waterproofing; Harbison-Walker Rfrs. Company, face brick; Batterson & Eisele, travertine stone and marble work; Hecla Iron Works, ornamental iron and bronze work; H. W. Miller, Inc., ornamental plastering; Lorillard Refrigerator Company, refrigerators; P. & F. Corbin, hardware; Arthur Greenfield, metal lathing; Mississippi Wire Glass Company, wire glass; Lincoln Mfg. Company, Betula walnut for office doors and trim; Guastavino System for concourse ceiling; Barrett Mfg. Company, specification roofing with vitrified tile surfacing; Manhattan Fireproof Door Company, kalamein work; Deneville Hydraulic Composite Stone Company, composite stone; Western Electric Company, Trenton Potteries Company and Otis Elevators.



This illustrates a portion of the 36 stairways, built of steel and iron with brass rails, running from concourse to train platforms, Pennsylvania Station, New York; also the train indicators at head of stairs, and the heavy wrought iron fence around the concourse. Executed by the Hecla Iron Works.

The contract for the ornamental iron work was awarded to the Hecla Iron Works, and included all of the stairways, railings, fence, train indicators, enormous glass and iron screens between arcade and waiting rooms, lunette windows above waiting rooms, and other large windows throughout the building, bronze grilles at ticket offices, telephone booths and parcel rooms, street lamps, elevator enclosures, service stairs, etc.; also, the bronze counter screen for the Penna. Branch of the Corn Exchange Bank on the 7th Ave entrance of building.



This illustrates one of the enormous iron screens for six main entrances, Pennsylvania Station, New York. These are the largest screens erected in any building in New York, and were executed by the Hecla Iron Works.

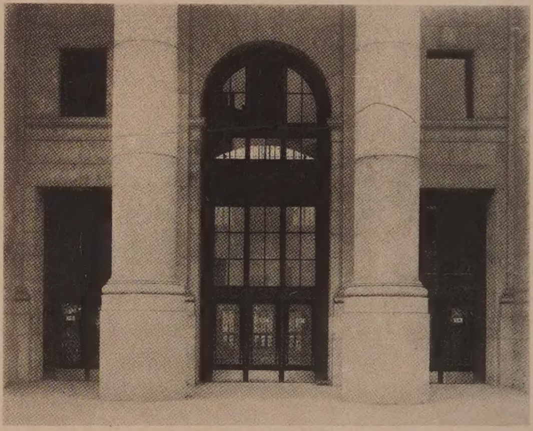
The work of the Hecla Iron Works is of the highest class. An idea of the magnitude of their contract can be gained when we state that four million pounds of wrought iron and cast iron, brass, bronze and copper were necessary in the manufacture of it.

AGREEMENTS FOR BUILDING CONTRACTS.*

BUILDING contracts may be said to be divisible into four parts or divisions.

1. Matters Preliminary to Contracts.—Being the terms under which a contract is awarded, and giving the general information necessary before the execution of the agreement. It would include the "Form of Agreement" and "Schedule of Conditions of Contract" as given hereafter.

2. Agreement (or so-called Contract).—Being the instrument executed between the owner and contractor, legally and formally binding them to fulfill their obligations. It should properly include the "Schedule of Conditions of Contract."



The above illustration is one of the many examples of ornamental iron work executed by Hecla Iron Works. It represents one of the 6 entrances on 31st and 33rd Sts., and on 8th Ave., leading down to concourse.

3. Specification.—Being the detailed written description of the method of construction and of the quality and kind of materials to be furnished.

4. Drawings.—Being the detailed, graphic design of the work to be done, with the quantity and sizes of materials.

A building contract is entered into by the owner in order to obtain the services of a contractor who is skilled in that particular kind of work, and by the contractor because he expects to make a certain profit in remuneration for his services and knowledge. Assured of his profit, it is immaterial to the contractor what kind of work the owner or engineer may desire to have done, but if the contractor's profit is not assured, he becomes vitally interested in anything that may tend to affect this prospective profit. With the contractor, the work is purely a business proposition; he expects to make a certain profit for doing a particular amount of work. He must make a legitimate profit; his business life depends on it; and the more he feels this slipping away from him the more diligently will he find ways and means to reimburse himself. Even the best of

(*Continued page xxviii*)

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*Extract from a paper read before Am. Society of Civil Engineers Feb. 2, 1910, by Wm. B. Bamford, Asso. M. Am. Soc. C. E.

"TARGET-AND-ARROW" Tin Roofs on Factory Buildings

This illustration shows one of the many buildings connected with the plant of the Chicago Varnish Co., 855 Elston Avenue, Chicago. Since 1887 to the present day "TARGET-AND ARROW" tin has been the standard roofing used on all the permanent buildings of this plant. Additions to the plant were made in 1888, 1892, 1895, 1899, 1900, 1903 and 1905, requiring 22,500 sq. ft. of our roofing tin. The architects in charge of the construction work at the plant—Doerr Brothers, Chamber of Commerce Bldg., Chicago, are enthusiastic over the satisfactory results obtained from the use of this brand of tin and report that all the roofs are in excellent condition. These roofs are located in the midst of the manufacturing district, exposed to smoke from the numerous stacks and from locomotives constantly passing.

They have required no repairs or attention other than an occasional coat of paint to keep the upper surface in perfect condition. The choice of a "TARGAT-AND-ARROW" tin roof for a factory building is an indication that the owners have faith in the permanence of the business and see the wisdom of using high-class, durable material that will prove a good investment as time goes on, rather than a source of trouble and expense.

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1810 OUR CENTENNIAL YEAR **1910**

(Continued from page 164)

contractors will try hard to obtain this profit in one way or another, else they must ultimately be forced from business and leave the field to those who are probably less competent contractors but shrewder business men.

A contract is intended to insure that an owner will obtain a definite piece of work for a stated sum and within a given time, and to insure that, for doing this, a contractor will be paid stated sums of money at definite times. The contract, therefore, should be drawn so that the owner can demand and obtain his work and the contractor his payments with the least delay and difficulty.

It is thought that the provisions of the agreement and schedule of conditions of contract given hereafter will protect more equitably the interests of all parties, and permit the engineer to enforce more certainly the proper fulfillment of the contract obligations than has been possible under the majority of such documents which have come to the writer's notice.

At present the systems of contracting used in building work may be divided into two general classes, the lump-sum system and the various percentage systems. They are often designated by the manner in which the work is to be paid for, as:

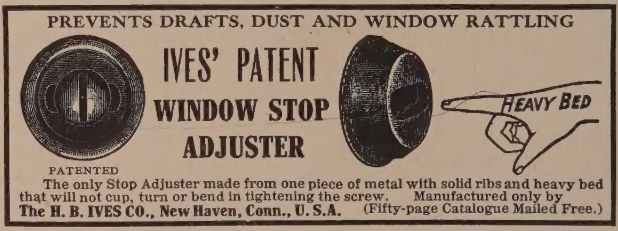
1. Lump sum:
2. Cost, plus a percentage;
3. Cost, plus a percentage—where the general contractor takes estimates for sub-branches of work, and makes lump-sum contracts, with the engineer's approval;
4. Cost, plus a percentage, with guaranteed limit;
5. Cost, plus a fixed sum;
6. Cost, plus a fixed sum, with a bonus if cost is less than a fixed sum, and a penalty if it exceeds such sum.

Of these, the lump-sum system is the most usual, and is theoretically the best. Such a system pre-supposes that the contract defines the work to be performed, and that a contractor, therefore, can determine accurately what the execution of such work will cost. If, however, the contract requirements are indefinite, the contractor is never certain, no matter how conscientious he may be, that he may not be required, under broad or ambiguous clauses of the contract, to furnish more than he honestly understood would be required from his reading of the contract when estimating. Thus he may be forced to do work at a net loss instead of a profit. Under the various percentage systems, on the contrary, the contractor is assured of his profit, no matter how much work he may be required to do.

The lump-sum contract is superior to the percentage type because it more truly fosters fair and open competition, and is more economical, as has been demonstrated amply by many men of ripe experience. This presumes that the drawings and specifications describe completely and accurately everything that the contractor must do or furnish, especially where an expense is involved. If this is not done, the contractor's prices become mere gambles on probabilities, and not accurate estimates of actual costs plus a legitimate profit. In such a case is it to be wondered at that a contractor will fight at every legitimate opening in order to protect his final profit? He is not always able legally to demand additional compensation for the work which has actually cost him more than the estimated amount, therefore his only opportunity to make up his losses and come out with a fair total profit is by obtaining good prices for additional work, or, if it does not appear that there will be any such worth while, the contractor must find flaws in the contract and endeavor to get all the extra money he can, through technicalities or otherwise.

With the irresponsible or dishonest contractor there need be no sympathy, but by far the greater number of contractors only desire their legitimate profit, and the prospect of making a fair profit by hard, honest work is none too bright at the present time, under the usual lump-sum contract.

Assuming that the contractor is honest, and that the bills and statements he presents for payment are correct, and have all discounts, except a cash discount deducted, the cost of percentage work is apt to exceed the cost of work done under a lump-sum contract. The reasons for most of this increase are not hard to find. The contractor, not being responsible for the cost, and having his profits assured, readily makes any changes and does work as directed, no matter how expensive or uneconomical such work may be, and the owner does not realize how expensive his fads or fancies will be until the work is completed. Then again, if the percentage is based on the total cost, there is not the incentive for the contractor to become as zealous in obtaining the closest prices for materials as he would under a lump-sum contract.



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